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Compaq Computer
Corporation

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Compaq Survey Utility

This paper provides an overview of the technology, features and use of Compaq Survey Utility.

EXECUTIVE SUMMARY

With the complexity of today's server applications and the criticality of data stored on servers, maximizing server availability is a requirement in order to maintain the successful operation of a business. Compaq Survey Utility was designed as a service tool, in order to deliver enhanced serviceability for Compaq servers, and increase overall availability.

In addition to robust management tools, service tools can be invaluable in bringing about the quick resolution of server problems. In order to streamline the service process, and resolve problems quickly, it is necessary to have the right information available at the time that a service call is placed. The primary information requirement, and the one that provides the greatest insight into potential server issues, is the configuration of the system. Compaq Survey Utility delivers this critical data, and addresses customer requirements for enhanced service tools and higher server availability through its comprehensive feature design:

- *On-line installation and operation:* No requirement to take the server off-line or reboot the server in order to use Compaq Survey Utility
- *Comprehensive configuration capture under a single tool:* Gathers detailed bardware and operating system configuration information under a single tool.
- *Automatic configuration audit trail:* Compaq Survey Utility automatically maintains a configuration history for the server. By storing multiple configuration snapshots and highlighting changes and differences, the utility is able to provide a detailed record of the server history.

This combination of features simplifies the service process, and minimizes downtime experienced by a server. Versions of Compaq Survey Utility are available for Microsoft Windows NT™ and Novell NetWare, and the utility is supported on all ProSignia and ProLiant servers.

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Document Number : ECG075/0798

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INTRODUCTION

In today's business environment servers are being deployed to run increasingly critical and complex applications. The successful operation of the business depends on the continuing operation of the servers. Therefore, server availability has become a key requirement.

Enhanced server management tools have been developed to aid in optimizing the performance of the system and identifying potential problems before they are manifested to users on the system. In the event that a problem does occur, however, tools must be available that allows administrators to work issues and resolve problems without taking the server off-line. Tools that can provide on-line serviceability are able to deliver an increase in server availability, minimizing the interruption of daily business activities.

Compaq Survey Utility was developed to fill the need for an on-line service tool.

THE IMPORTANCE OF SERVICE TOOLS

The complexity of environments combines with the fact that administration budgets and staffs are shrinking, resulting in the requirement that servers must not only be highly available, but tools must be available to make administrators more efficient. Effective service tools are as important as ongoing management tools in meeting this objective. Service tools ensure that in the event a problem does occur, it will be resolved quickly and easily in order for the server to continue to support users and applications.

Administrators today encounter a number of challenges in managing their environments. As a result of these challenges, specific requirements have emerged in terms of improving serviceability. The primary requirements for service tools include:

- On-line functionality to identify and resolve problems without taking the server off-line
- Simplify the collection process for gathering the information required to effectively resolve service cases
- Deliver automatic configuration tracking and audit trail history that is accessible on-demand

Fulfilling all of these requirements results in:

- Faster problem resolution times
- Minimized administration costs and resources
- Higher server availability

Compaq Survey Utility was designed to address these user requirements and deliver the benefits of higher availability and minimized costs.

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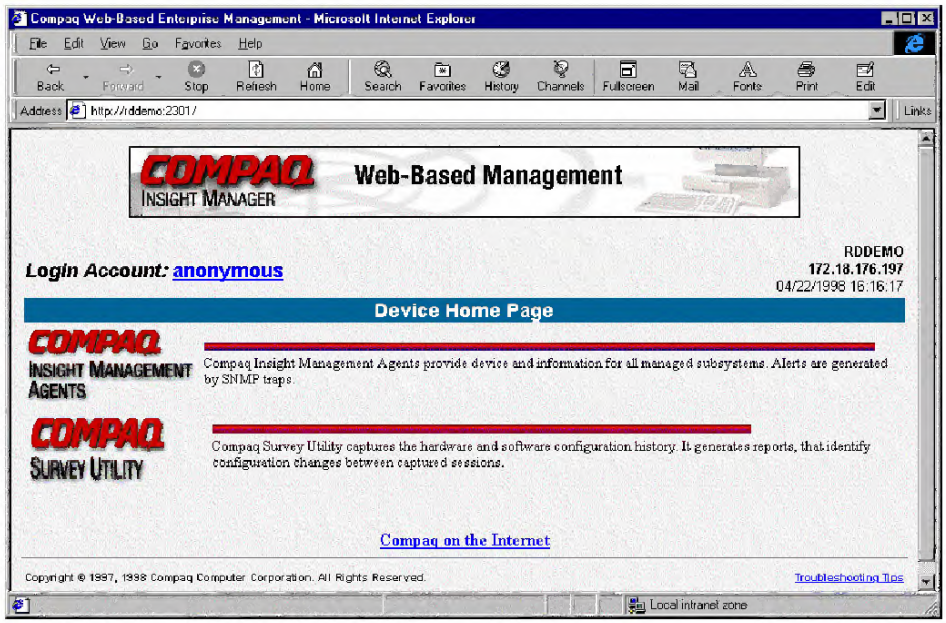
WHAT IS COMPAQ SURVEY UTILITY?

Compaq Survey Utility is an online information-gathering agent similar to other Compaq management agents that run on servers. It gathers critical hardware and software information from various sources to give a complete view of the server. Survey Utility delivers comprehensive configuration capture, provides a means for automatically identifying and comparing configuration changes, and automatically maintains a server configuration history. The information is saved as a history of multiple sessions in a single configuration history file that can be downloaded to the user's system.

This utility was developed to allow resolution of problems without taking the server off-line and to assist in maximizing server availability. The information obtained by the utility is useful in troubleshooting server problems, and streamlines the service process by enabling quick and easy identification of server configurations, which is the first step in resolving service cases.

Compaq Survey Utility version 2.04 and later includes a web browser interface in addition to the command-line interface to allowing access using a familiar user interface. This also enables remote control of the utility and facilitates easy transfer of survey information from remote machines to a service provider.


Compaq Web-Based Enterprise Management - Microsoft Internet Explorer
File Edit View Go Favorites Help
Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen Mail Fonts Print Edit
Address http://rddemo:2301/
Links
COMPAQ INSIGHT MANAGER
Web-Based Management
Login Account: anonymous
RDDEMO
172.18.176.197
04/22/1998 16:16:17
Device Home Page
COMPAQ INSIGHT MANAGEMENT AGENTS
Compaq Insight Management Agents provide device and information for all managed subsystems. Alerts are generated by SNMP traps.
COMPAQ SURVEY UTILITY
Compaq Survey Utility captures the hardware and software configuration history. It generates reports, that identify configuration changes between captured sessions.
Compaq on the Internet
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Troubleshooting Tips
Local intranet zone

Theory of Operation

The Compaq Survey Utility captures data as sessions; a session is defined as an organized group of data describing the configured state of the system at a specific point in time. The Compaq Survey Utility maintains up to 10 distinct sessions.

The session information is maintained in a file called SURVEY.IDI, located in the same directory as the executable portion of the program. This file contains all of the binary information captured for every session. This file can be analyzed locally by the Survey

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Utility, or it can be sent to another location such as a help center, or to Compaq where the Survey Utility can generate custom reports on the information.

The sessions are organized as three distinct types:

Active

The Active session (referenced as session number 1) is the most recent information captured. The utility overwrites this session each time a sample is taken. When using Compaq Survey Utility from a browser, sessions will be listed by the date and time of the session rather than by the number of the session.

Original

The Original session (referenced as session number 2) is the first session sampled. The Compaq Survey Utility will treat this session as a "master configuration" and the utility will never overwrite this session.

Checkpoint

The Checkpoint sessions (referenced as session numbers 3 to 10) are the next 8 samples that "differ significantly" from the previous session. These sessions are maintained in a "first in, first out" (FIFO) fashion and may be deleted as newer Checkpoint sessions are added. The "significance" of a Checkpoint is determined programmatically based on the type of information captured. The utility makes an attempt to only generate a Checkpoint when something that would not change under normal operation of the server is changed. So, not all items that change will generate Checkpoints.

KEY FEATURES

In developing the Survey Utility, Compaq addressed the primary requirements customers bave for service tools. These requirements were designed in as key features of the product:

On-line Serviceability

A key benefit of Compaq Survey Utility is that it delivers configuration capture and reporting in an on-line format. Not only can Compaq Survey Utility collect information while the server is on-line, but can also be initially installed without having to reboot the server.

On-line configuration capture is critical, because when the need for a service call does arise, one of the first requests made of the customer is to provide detailed configuration information. Service personnel use this information to determine possible component interactions and pinpoint problem sources. Without having a clear understanding of the system configuration, the problem resolution process cannot move forward effectively.

Compaq Survey Utility represents an enhancement to currently available service tools such as Inspect. Inspect bas long been used as an off-line utility to capture detailed hardware configuration information such as identification of hardware devices installed and critical error log information. Survey Utility adds to this capability by capturing software information in addition to the hardware elements.

The on-line format of Survey Utility allows administrators to run the tool on demand, without any interruption to applications or users.

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Simplified Collection Process

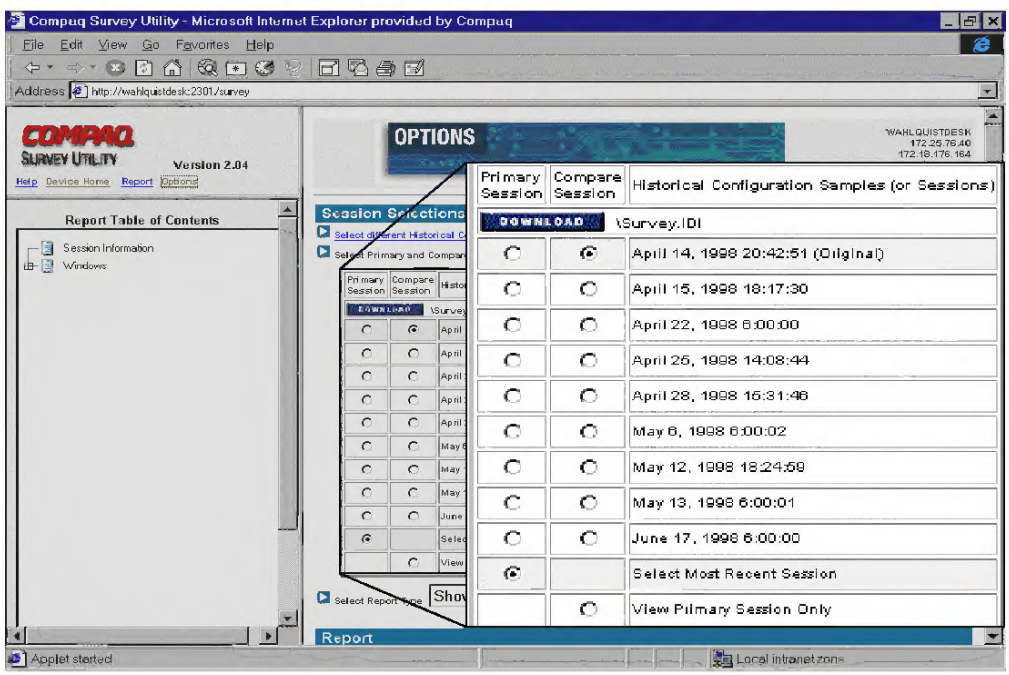
In order to meet the information requirements for a service call, a user is typically asked to complete a number of steps. It includes capture of information relating to NetWare modules, operating system version number, operating system parameters, operating system error log files, startup files, etc. This is in addition to the hardware configuration information. This process requires administrators to generate reports from multiple sources.

Use of Survey Utility reduces the time and effort needed to collect this information. By combing hardware and software configuration capture, Compaq Survey Utility delivers a comprehensive view of the server with the ease and simplicity of a single tool. This single tool approach minimizes problem resolution time, and also minimizes administration resources because less time is spent resolving problems when they do occur.

Automated Configuration History / Audit Trail Reporting

In addition to capturing and reporting the current configuration, another primary customer need is a tool to provide effective configuration tracking. Compaq Survey Utility also satisfies this need.

The audit trail feature of Compaq Survey Utility maintains a record of configurations, and has the intelligence to automatically identify and highlight where changes in the configuration have occurred. Upon an event trigger (either a reboot of the server, scheduled time interval, or user-initiated action) Compaq Survey Utility collects a snapshot view of the hardware and operating system configuration, and stores the file on the server.



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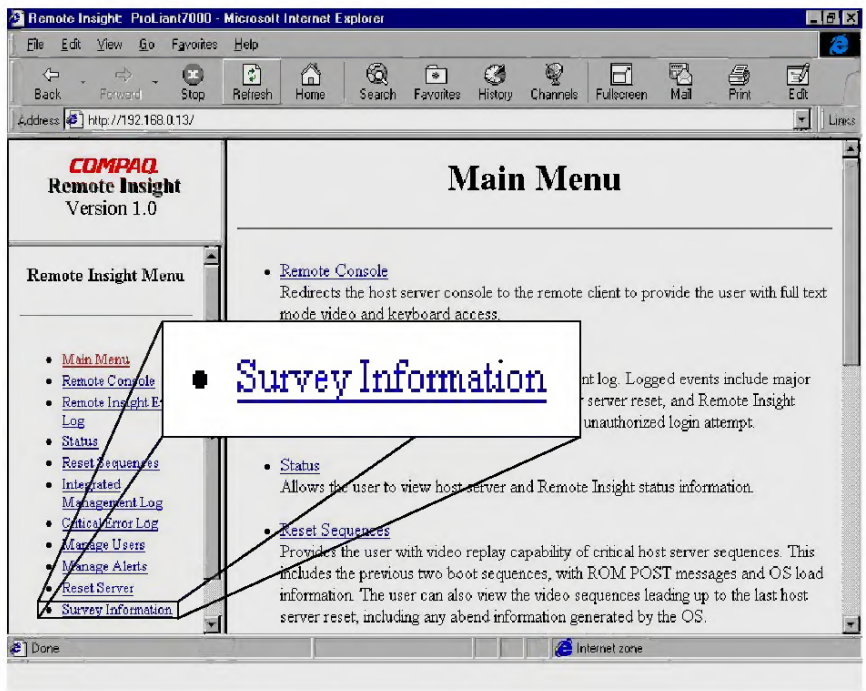
The audit trail feature operates by maintaining multiple snapshots of the configuration in a file. Eight snapshot generations plus the initial baseline configuration and the active session are all maintained as part of the configuration audit trail. As each snapshot is taken, it is compared to the previous generation already stored in the Survey Utility file to judge whether a significant change has occurred. If a significant change is detected, then the differences are "checkpointed" to automatically highlight where they have occurred. All configuration snapshots are time and date stamped to ensure that the administrator or service provider is always able to identify when a particular change took place.

Integrated with the Remote Insight Board

Each time the Survey Utility captures the system configuration, it also saves it in the memory of the Remote Insight Board (servers in which the Remote Insight Board has been installed). In instances when the server has lost power, the administrator can dial into the Remote Insight Board and view information that is critical to bring the server back up as soon as possible. Critical information such as the hardware and software configuration information collected by the Survey Utility is now available to the user.


Remote Insight: ProLiant7000 - Microsoft Internet Explorer
File Edit View Go Favorites Help
Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen Mail Print Edit
Address http://192.168.0.13/
COMPAQ
Remote Insight
Version 1.0
Remote Insight Menu
Main Menu
Remote Console
Remote Insight E
Log
Status
Reset Sequences
Integrated
Management Log
Critical Error Log
Manage Users
Manage Alerts
Reset Server
Survey Information
Main Menu
Remote Console
Redirects the host server console to the remote client to provide the user with full text mode video and keyboard access.
Survey Information
nt log. Logged events include major
server reset, and Remote Insight
unauthorized login attempt.
Status
Allows the user to view host server and Remote Insight status information.
Reset Sequences
Provides the user with video replay capability of critical host server sequences. This includes the previous two boot sequences, with ROM POST messages and OS load information. The user can also view the video sequences leading up to the last host server reset, including any abend information generated by the OS.
Done
Internet zone

HOW COMPAQ SURVEY UTILITY WORKS

The Compaq Survey Utility agent resides on each managed server and communicates with device drivers in the system to capture detailed information. This communication, or interaction, includes capturing data from sources such as: the file systems, the system BIOS, SCSI drivers, disk array drivers, the NT Hardware Abstraction Layer (HAL), the NT Registry, NetWare API's, and the Compaq health driver. This enables the Survey agent to identify both hardware and operating system information within the same polling process. When a configuration snapshot is initiated, the Survey Utility agent polls all of

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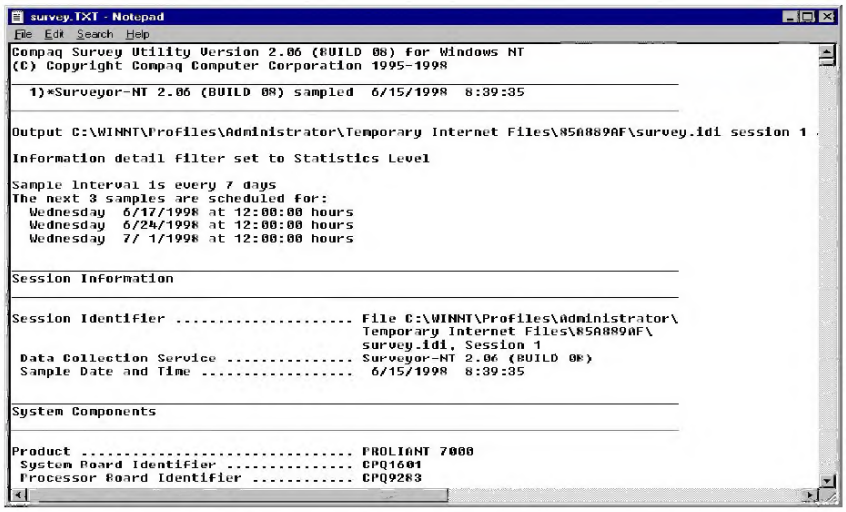
these sources for the most up to date information and view of the system. This makes it truly an on-line service tool.

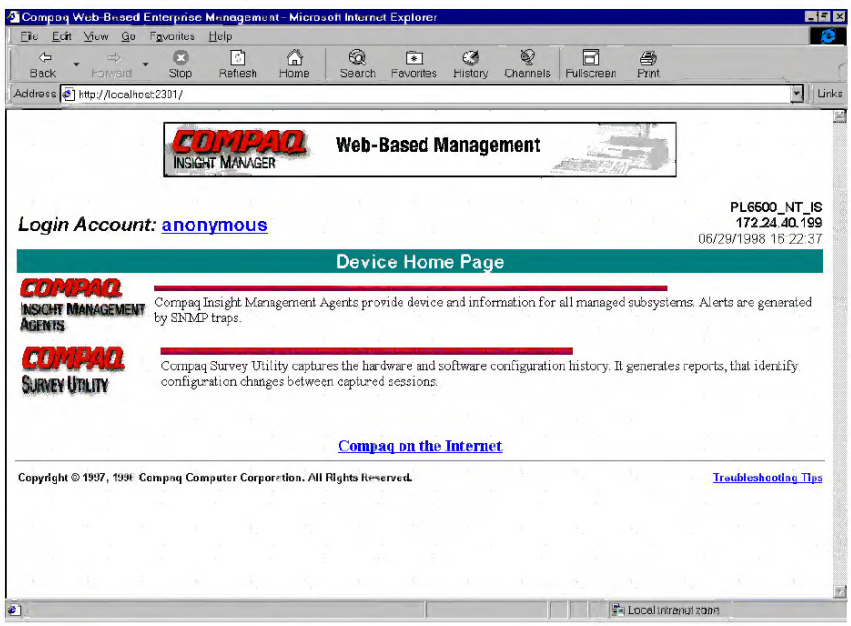
Accessing and Viewing Information

The information the utility gathers can be accessed in the following ways:

- **Locally at the host server console (Survey.txt)**


survey.TXT - Notepad
File Edit Search Help
Compaq Survey Utility Version 2.06 (BUILD 08) for Windows NT
(C) Copyright Compaq Computer Corporation 1995-1998
1)*Surveyor-NT 2.06 (BUILD 08) sampled 6/15/1998 8:39:35
Output C:\WINNT\Profiles\Administrator\Temporary Internet Files\85A889AF\survey.idi session 1
Information detail filter set to Statistics Level
Sample Interval is every 7 days
The next 3 samples are scheduled for:
Wednesday 6/17/1998 at 12:00:00 hours
Wednesday 6/24/1998 at 12:00:00 hours
Wednesday 7/ 1/1998 at 12:00:00 hours
Session Information
Session Identifier ..... File C:\WINNT\Profiles\Administrator\
Temporary Internet Files\85A889AF\
survey.idi, Session 1
Data Collection Service ..... Surveyor-NT 2.06 (BUILD 08)
Sample Date and Time 6/15/1998 8:39:35
System Components
Product ..... PROLIANT 7000
System Board Identifier CPQ1601
Processor Board Identifier CPQ9283

- **Remotely or locally from a browser.**


Compaq Web-Based Enterprise Management - Microsoft Internet Explorer
File Edit View Go Favorites Help
Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen Print
Address http://localhost:2301/
Links
COMPAQ INSIGHT MANAGER
Web-Based Management
Login Account: anonymous
PL6500_NT_IS
172.24.40.199
06/29/1998 15:22:37
Device Home Page
COMPAQ INSIGHT MANAGEMENT AGENTS
Compaq Insight Management Agents provide device and information for all managed subsystems. Alerts are generated by SNMP traps.
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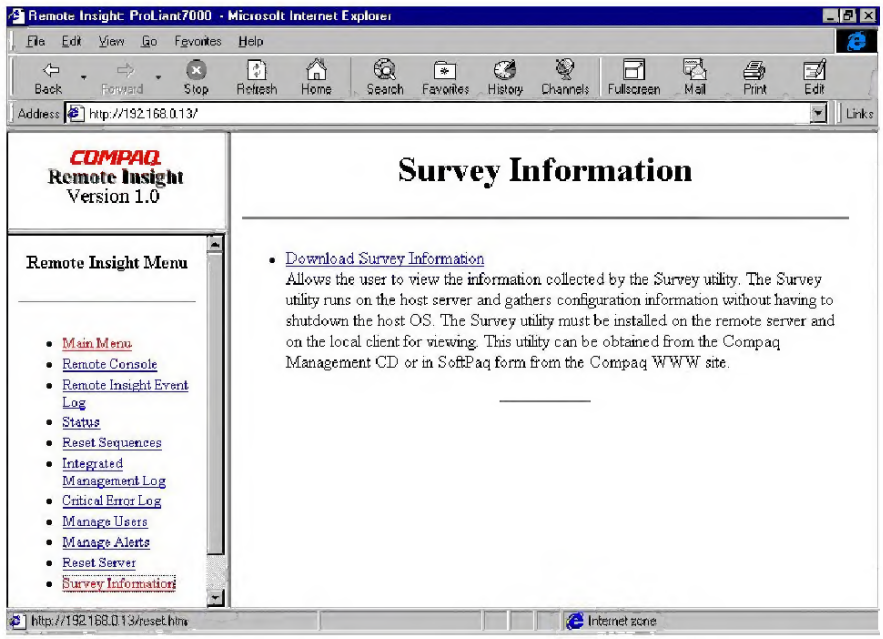
- **Remotely or locally via the Remote Insight Board**


Remote Insight ProLiant7000 - Microsoft Internet Explorer
File Edit View Go Favorites Help
Back Forward Stop Refresh Home Search Favorites History Channels Fullscreen Mail Print Edit
Address http://192.168.0.13/
Links
COMPAQ
Remote Insight
Version 1.0
Remote Insight Menu
Main Menu
Remote Console
Remote Insight Event Log
Status
Reset Sequences
Integrated Management Log
Critical Error Log
Manage Users
Manage Alerts
Reset Server
Survey Information
Survey Information
Download Survey Information
Allows the user to view the information collected by the Survey utility. The Survey utility runs on the host server and gathers configuration information without having to shutdown the host OS. The Survey utility must be installed on the remote server and on the local client for viewing. This utility can be obtained from the Compaq Management CD or in SoftPaq form from the Compaq WWW site.
http://192.168.0.13/reset.htm
Internet zone

The available options allow the information to be parsed in several ways in order to provide different types and levels of information. The administrator cannot only request viewing of the active session, but since multiple configuration snapshots are stored, can request that the Survey Utility generate a report, which automatically compares any two snapshots. In completing the comparison, Survey Utility will automatically match the snapshots and highlight any differences that exist between them. This is a useful feature for enabling clear audit trail tracking. It allows the administrator or service provider to identify the history of events and the order and point at which specific changes were made, which provides significant assistance in identifying the source of server problems.

With the comparison feature, several report types are available which enable the administrator to specify just the particular type and level of information that will be most useful in a particular case. The different report types available are:

- **Show Only Differences Report**: This feature provides a mechanism for filtering the level of information displayed when comparing two different configuration snapshots (or sessions). For example, when a user requests that Survey Utility generate a comparison of sessions 3 and 5 using the "differences" filter, the tool automatically compares those two sessions (which are already stored in the Survey file). It then generates a report that shows only the differences between the two generations. In this case, the differences report will include only differences, such as changes in CPU utilization levels, or amounts of free memory. Reviewing the differences occurring between different configuration snapshots can help identify trends causing intermittent server problems, such as low memory resources, or the CPU running at maximum capacity.

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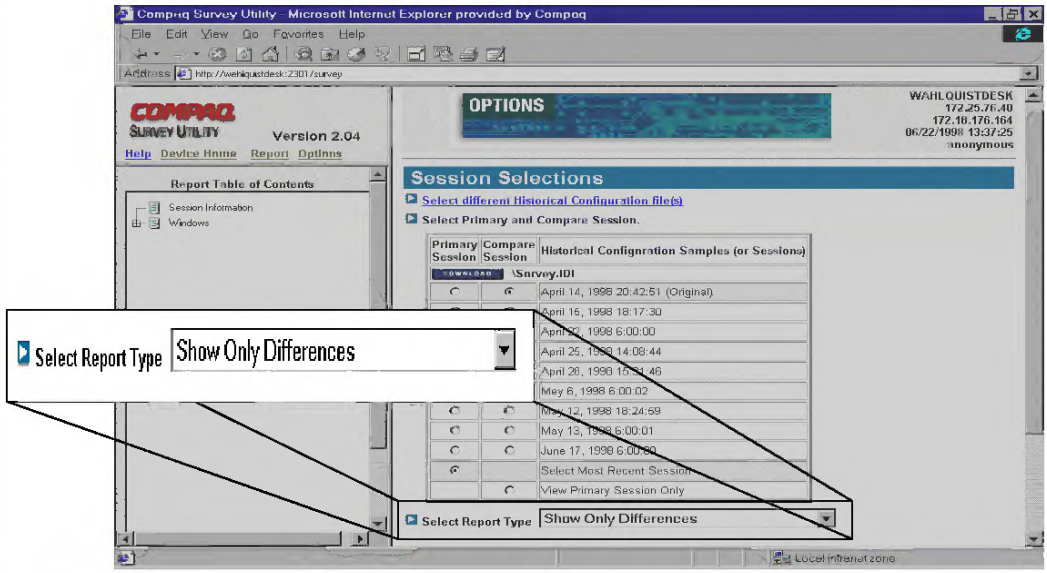

- **Show Only major Differences Report**: This feature provides a more targeted view of the system changes. The Show Only Major Differences Report provides a quick, at-a-glance view of only the significant changes that may have impacted the operation of the server. When the request for this information is issued, Survey Utility generates a report that shows only those differences between the two configuration sessions that caused a checkpoint to occur. This provides a mechanism to pinpoint what changes have triggered a problem with the server operation, such as a SCSI controller being removed, or identifying a NetWare NLM that is no longer loaded.
- **Show Standard Details and Differences Report**: This report identifies the basic components installed in the server. This report is useful for gathering a quick view of the server hardware and software assets. The summary report includes information such as hardware components that are installed and high-level information about the operating system.
- **Show More Details and Differences Report**: This report is generated under the default settings for the utility and provides the level of detail that is necessary for service personnel to get a clear picture of the system configuration. In addition to the high-level information provided in the summary report, this report provides a much greater depth of information on operating system services, drivers and NetWare modules that are running on the system.
- **Show All Details and Differences Report**: The Show All Details and Differences report is the most comprehensive report available through Compaq Survey Utility. This report is used in the event that the service person needs to drill down on a specific area of information, perhaps a checkpoint area that was highlighted in the advanced report. This report level goes a layer deeper to provide information on not only information regarding what is currently running, but providing a listing of all services configured on the server and more detailed disk drive parameter information.

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Collecting and Updating Compaq Survey Utility Information

Compaq Survey Utility provides flexibility in the way that the information is captured. It provides maximum assurance that the information available reflects the current state of the server and that the audit trail clearly reflects the stages of changes that have occurred. Just as several options are available for viewing and report generation, multiple methods are used for information collection.

- **Upon Server Reboot:** When installed for periodic capture, Survey Utility automatically captures a snapshot of information each time the server is rebooted. Once the Survey Utility is loaded on the server, this process bappens without administrator intervention. Since most significant configuration changes require a server reboot in order to be recognized, these capture points help provide maximum coverage for detecting changes. If a significant cbange is recognized, it will be checkpointed and stored. Any configuration differences will also be recorded.
- **Scheduled Intervals:** When installed for periodic capture, Survey Utility also provides a mechanism to automatically capture a configuration snapshot at a regularly scheduled time interval. While the default setting for this feature is once per week, the interval is configurable using command line parameters. The interval can be adjusted to occur as often as once a day. This scheduled interval feature allows the configuration audit trail to capture views of the system not only upon reboot, but also capture and identify differences, as well as significant configuration changes, during regular operation of the server. The scheduled interval feature is important in capturing system difference information, for example software changes made without a required reboot (loading and unloading NetWare modules).
- **User Initiated:** Compaq Survey Utility allows the administrator to initiate a new snapshot on-demand. While this feature can be used when the Survey Utility is configured for periodic capture, it is particularly useful for one-time collection.

All of the update options help to ensure that the latest information and change history is always recorded and available when needed.

Transferring and Printing Compaq Survey Utility Files

Using a web browser, the configuration history file (survey.idi) can be downloaded from the device to the local machine for mailing to a service provider. The reports can be printed while viewing it on the web browser.

Where there is no web browser access, the Survey Utility output file can be accessed in its text form. With appropriate access rights, users may login over a standard network or modem connection to view or transfer the file. Any text editor may be used to print the Survey Utility reports (survey.txt), since the output report is stored in standard text output.

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CONCLUSION

Compaq Survey Utility was developed to address customer requirements for improved serviceability and increased server availability. Survey Utility addresses these needs by providing on-line access to the critical information required to resolve service cases quickly.

By automatically collecting and storing comprehensive hardware and software configuration snapshots, Survey Utility removes much of the time and effort that administrators and service providers had to spend to collect the relevant information for different sources. Survey Utility has eliminated the need to use a combination of on-line and off-line tools and generate multiple reports. Comprehensive hardware and operating system configuration information is required to resolve service issues quickly. With Compaq Survey Utility all of this information is gathered and stored quickly, within a single source file.

Different formats of reports can be generated depending on the needs of the user. At the same time, the information can be accessed in a number of ways, making Compaq Survey Utility a flexible tool. Compaq Survey Utility helps deliver Compaq's commitment to continue improving the serviceability and availability of Compaq servers.

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SPECIFICATIONS

Supported platforms	All Compaq ProSignia and ProLiant servers
Supported operating systems	Windows NT 3.51 or 4.0
	Windows 95(reporting only; used for viewing Survey information gathered from Windows NT or NetWare systems)
	NetWare 3.12
	NetWare 4.x
	IntraNetWare
System requirements for browsing to a device	TCP/IP protocol installed
	A Supported Web Browser
Web Browser Recommendations	Microsoft Internet Explorer 4.01 (version 4.72.2106.8 or above) for Windows 95 and NT 4.0 NOTE: Internet Explorer 4.01 requires service pack 3 on NT 4.0.
	Netscape Navigator 4.04 or above NOTE: Navigator also requires the JDK 1.1 patch
	The browser must have the following features supported and enabled: • HTML tables • HTML frames • JavaScript • Accept All Cookies • Full Java Development Kit 1.1 (JDK 1.1) support
Availability	Copies of Survey Utility are distributed as part of Compaq SmartStart and the Compaq Management CD.
	It can also be downloaded from www.compaq.com, Compaq's web site on the World Wide Web.
	Updates are also supported via the Compaq Integration Server

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